CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 91-132

WASTE DISCHARGE REQUIREMENTS
FOR
SAN JOAQUIN REFINING COMPANY, INC.
WASTEWATER INJECTION WELL
KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. San Joaquin Refining Company, Inc., (hereafter Discharger) submitted a Report of Waste Discharge on 28 March 1989 requesting waste discharge requirements. A technical report on the project was submitted on 28 March 1989. Additional information was submitted to complete the technical report on 5 April 1989, 10 May 1990, and 9 October 1990. The property (Assessor's Parcel Nos. 332-040-18) is owned by the Discharger.

2. The Discharger proposes to dispose of refinery wastewater in one deep injection well.

3. The Discharger proposes to discharge a maximum of 0.10 mgd of wastewater from the Discharger's refinery.

4. This Order is being issued in compliance with Division 7 of the Water Code, Sections 13000 through 13999 (Porter-Cologne Water Quality Control Act).

5. The site is within the boundaries of the Fruitvale Oil Field, on the northwest side of Bakersfield, California, within the Tulare Lake Basin of the San Joaquin Valley. The proposed injection well will be at the Discharger's Bakersfield refinery (hereafter Plant) in Sections 23, T29S, R27E, MDB&M, as shown in Attachment A, which is part of this Order. Wastewater generated by the Plant is currently disposed of to an unlined surface impoundment.

6. The Board adopted Order No. 90-087 on 23 March 1990, prescribing waste discharge requirements for the unlined surface impoundment.

7. Topography in the area is flat. Activities in the area are associated with oil field production, refining, and limited industrial operations.

8. The facility lies outside the 100-year flood boundary area according to the Federal Insurance Administrator's "Flood Hazard Boundary Map".

9. The sedimentary section in the Fruitvale Oil Field ranges in thickness from 8,500 to 11,570 feet of Eocene to Recent marine and alluvial sediments, which overlie a basement complex of schist. The different formations within these sediments form the common limb of a faulted homocline that dips gently towards the southwest. This homocline is part of the deep, northwest trending structural basin known as the San Joaquin Basin.

10. According to information submitted by the Discharger, there are no significant faults which are active or potentially active on or immediately adjacent to the proposed injection site.

11. One minor subsurface, high angle fault, with approximately 20 feet of offset, is shown in prior publications to exist adjacent to the area underlying the injection site approximately 500 feet northeast of the proposed injection well. The presence of this fault is inferred from the distribution of oil in the subsurface sediments. The fault is not observed in wells which cross the inferred fault-plane.

12. The Discharger submitted information demonstrating that the entrapment of the oil is probably due to the pinching-out of discontinuous sand bodies in the subsurface. A past convention within the oil industry was to indicate the updip limit of oil accumulation by a fault, irregardless of the actual mechanism of oil entrapment. The publications which first illustrated this possible fault were published over 25 years ago and appear to follow this prior convention. The presence of a fault at this location thus appears to be a misconception based on negative evidence, which resulted in placing the fault on earlier maps as a matter of convenience to explain the occurrence of oil accumulations.

13. According to information submitted by the Discharger, there is presently one well within the radial area of influence of waste migration that is injecting into the equivalent injection disposal interval. The Texaco, W.I. No. 1 injection well is 640 feet south of the proposed injection well.

INJECTION WASTE STREAM

14. The waste stream consists of process waters generated from refinery units at the Plant operated by the Discharger and processed through the wastewater treatment plant. The refinery process units generating wastewater which is discharged to the wastewater treatment unit include: water softeners, boiler blowdown, cooling tower blowdown, lube plant waste water, crude oil process units, crude tanks, airblown asphalt plant, pump glands, product tanks, and other miscellaneous units associated with refinery operations.

15. Typical daily discharge is expected to be approximately 0.08 mgd with a maximum of 0.10 mgd. Waste streams will be piped to a wastewater treatment unit. Treated and filtered wastewater will be contained in storage tanks at the facility, then piped to the injection well for disposal. The injection facility has a design service life of 20 years.

INJECTION ZONE

16. Disposal of waste through the proposed injection well will be into the marine Santa Margarita formation. Injection will be between an approximate subsurface interval of 3,715 feet and 4,150 feet. The actual injection interval will be determined based on the results of data obtained during the drilling of the well.

17. Portions of the basal Etchegoin, Chanac, and Santa Margarita formations are currently hydrocarbon producing in the Fruitvale Oil Field within one mile of the injection wells.

18. The basal portion of the Etchegoin formation, which averages 200 feet thick, consists of interbedded Pliocene age coarse-grained, micaceous sands and gray, micaceous shales. The Pliocene-Miocene age Chanac formation unconformably underlies the Etchegoin formation, averages 1,100 feet in thickness, and consists of fine- to coarse-grained sands with interbedded siltstones and claystones. The upper Miocene age Santa Margarita formation underlies the Chanac formation and averages 1,000 feet in thickness and consists of fine- to coarse-grained sands, with shales comprising the lower part of the unit. Below the Santa Margarita formation exists the Fruitvale Shale, approximately 1,500 feet thick.

19. The basal Etchegoin, Chanac, and Santa Margarita formations are currently utilized for injection of Class II wastewaters in the Fruitvale Oil Field as defined in the Federal Underground Injection Control (UIC) program and administered by the California Division of Oil and Gas. These formations have been administratively classified as exempt aquifers for the purpose of Class II injection (oilfield produced wastewaters) within the Fruitvale Oil Field in accordance with UIC criteria. Class II injection within the Fruitvale Oil Field has been a continuing practice since June 1958.

20. Analysis of waters from the proposed injection zone indicates it is of poor quality with a total dissolved solids concentration greater than 3,000 mg/l. The proposed injection zone is not an underground source of drinking water in accordance with State of California criteria contained in Regional Board Resolution No. 89-098 (see Finding Nos. 23-26).

21. Table I is a comparison between the water quality of the waste stream and the formations of the injection zone. The Discharger figures represent analyses obtained from samples taken between 30 September 1987 and 13 May 1988.

Table I - Wastewater and formation water constituent levels.

Constituent mg/l; unless noted	SJR Wastewater	Santa Margarita Fm.	Title 22 Standard
Inorganic Constituents			
TDS	1909	5783	500.0
Conductivity (umhos/cm)	2651	8900	900
pH	8.5	7.7	
Arsenic	0.013	0.175	0.05
Barium	<0.5	0.55	1.0
Boron	0.35	7.0	
Cadmium	0.02	<0.01	0.01
Calcium	-	160	
Chloride	189.0	2625	250
Chromium (tot.)	<0.05	0.44	
Copper	0.02	2.3	1.00
Fluoride	<0.1	<0.1	4.0
Iron	-	42	0.35
Lead	0.04	1.32	0.05
Magnesium	-	49	
Manganese	-	1.5	0.05
Mercury (ug/l)	0.006	0.002	0.002
Potassium	-	24	
Selenium	0.001	<0.35	0.01
Sodium	-	1800	
Sulfate	515.0	15.0	250
Sulfite	-	191	
Vanadium	0.5	<0.35	
Zinc	0.08	3.06	5.0
Organic Constituents			
Benzene (ug/l)	24.0	6,431	1.0
Ethylbenzene (ug/l)	12.9	5,993	680.0
Phenol	0.15	5.9	
Toluene (ug/l)	697.0	5,947	100.0
Xylene (ug/l)	62.8	5,280	1,750.0
2,4-Dimethylphenol (ug/l)	-	411	